

Claim Amendments

Claims 1 – 56 (canceled)

57 (withdrawn) A method of investment casting of a pattern, the method comprising the steps of: applying a shell material slurry to the pattern, wherein the slurry includes particles of varying size, and wherein some of the particles being greater than about 100 mesh.

58 (withdrawn) The method of claim 57, wherein the slurry has a viscosity greater than about 2500 centipoise (cps).

59 (withdrawn) The method of claim 58, wherein the viscosity is greater than about 10,000 cps.

60 (withdrawn) The method of claim 59, wherein the viscosity is greater than 100,000 cps.

61 (withdrawn) The method of claim 57, further comprising the steps of: allowing the applied slurry to harden into a shell; and filling the shell with a molten metal in less than about twenty-four (24) hours from completion of said applying step.

62 (withdrawn) The method of claim 61, wherein said filling step is performed in less than about six hours from completion of said applying step.

63 (withdrawn) The method of claim 61, further comprising melting the pattern from the shell prior to said filling step.

64 (withdrawn) An investment casting method comprising the steps of: applying a shell material to a pattern; allowing the coated pattern to harden into a shell to create a coated pattern; removing the pattern from the shell; filling the shell with a molten metal; allowing the molten metal to solidify into an article; removing the shell from the article; and wherein the shell material is a slurry including colloidal silica, zircon flour, and fused silica.

65 (withdrawn) A method of casting comprising the steps of: applying a face coat to a pattern; allowing the face coat to at least partially dry; coating the pattern with a slurry composition to create a coated pattern; allowing the coated pattern to harden into a shell; filling the shell with a molten metal; allowing the molten metal to solidify into an article; and removing the shell from the article.

66 (withdrawn) The method of claim 65, wherein the pattern is made from a material with a lower melting temperature than the shell.

67 (withdrawn) The method of claim 65, wherein said coating step is performed by brushing.

68 (withdrawn) The method of claim 65, wherein the face coat operates to minimize oxidation on an inside surface of the shell.

69 (withdrawn) The method of claim 65, further comprising removing the pattern generally simultaneously with said filling step.

70 (withdrawn) The method of claim 65, wherein the face coat includes: colloidal silica; zircon flour; and fused silica.

71 (withdrawn) The method of claim 70, wherein the face coat further includes latex colloidal silica.

72 (withdrawn) The method of claim 71, wherein the face coat further includes corn starch.

73 (withdrawn) The method of claim 65, wherein said filling step is performed in less than twenty-four hours from completion of said coating step.

74 (withdrawn) The method of claim 73, wherein said filling step is performed in less than six hours from completion of said coating step.

Claim 75 (new) A mold-forming composition for use in producing an investment casting shell, the mold-forming composition comprising:

a colloidal silica providing 20.3% to 37.5% of the mold-forming composition's weight;

a zircon flour providing 15.2% to 35.6% of the mold-forming composition's weight, wherein most of the zircon flour has a zircon particle size of 200 mesh to 350 mesh;

a fused silica providing 12.9% to 21.3% of the mold-forming composition's weight, wherein most of the fused silica has a silica particle size of 90 mesh to 150 mesh;

an alumina providing 6.4% to 27.8% of the mold-forming composition's weight, wherein most of the alumina has an alumina particle size of 50 mesh to 325 mesh; and

a thickness-promoting material providing 0.7% to 2% of the mold-forming composition's weight, wherein the following is true:

- a) the fused silica plus the alumina combined provide 21.2% to 40.7% of the mold-forming composition's weight,
- b) the fused silica plus the zircon flour combined provide 28.1% to 56.8% of the mold-forming composition's weight, and
- c) the zircon flour plus the alumina combined provide 35.6% to 47.2% of the mold-forming composition's weight.

Claim 76 (new) A mold-forming composition for use in producing an investment casting shell, the mold-forming composition comprising:

a colloidal silica providing 20.3% to 37.5% of the mold-forming composition's weight;

a zircon flour providing 15.2% to 35.6% of the mold-forming composition's weight, wherein most of the zircon flour has a zircon particle size of 200 mesh to 350 mesh;

a fused silica providing 12.9% to 21.3% of the mold-forming composition's weight, wherein most of the fused silica has a silica particle size of 90 mesh to 150 mesh;

an alumina providing 6.4% to 27.8% of the mold-forming composition's weight, wherein an appreciable amount of the alumina has an alumina particle size of substantially 200 mesh; and

a thickness-promoting material comprising a mixture of corn starch and welan gum, wherein the thickness-promoting material provides 0.7% to 2% of the mold-forming composition's weight, wherein the following is true:

- a) the fused silica plus the alumina combined provide 21.2% to 40.7% of the mold-forming composition's weight,
- b) the fused silica plus the zircon flour combined provide 28.1% to 56.8% of the mold-forming composition's weight, and
- c) the zircon flour plus the alumina combined provide 35.6% to 47.2% of the mold-forming composition's weight.

Claim 77 (new) A mold-forming composition for use in producing an investment casting shell, the mold-forming composition comprising:

a colloidal silica providing 20.3% to 37.5% of the mold-forming composition's weight;

a zircon flour providing 15.2% to 35.6% of the mold-forming composition's weight, wherein most of the zircon flour has a zircon particle size of substantially 325 mesh;

a fused silica providing 12.9% to 21.3% of the mold-forming composition's weight, wherein most of the fused silica has a silica particle size of substantially 120 mesh;

an alumina providing 6.4% to 27.8% of the mold-forming composition's weight, wherein an appreciable amount of the alumina has an alumina particle size of substantially 200 mesh; and

a thickness-promoting material comprising a mixture of corn starch and welan gum, wherein the thickness-promoting material provides 0.7% to 2% of the mold-forming composition's weight, wherein the following is true:

- a) the fused silica plus the alumina combined provide 21.2% to 40.7% of the mold-forming composition's weight,
- b) the fused silica plus the zircon flour combined provide 28.1% to 56.8% of the mold-forming composition's weight,
- c) the zircon flour plus the alumina combined provide 35.6% to 47.2% of the mold-forming composition's weight, and
- d) the mold-forming composition has a viscosity greater than 10,000 cps.